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ABSTRACT

There is a major project in India to collect data for the generation of developmental norms of children from 2 1/2 to 5 years of age. The pilot study of this project, whose main objective was the adaptation of measures of developmental parameters to the unique needs of India, was reported to PS 003 284. The present document reproduces a study that attempts to validate the findings of a cross-sectional study of Indian developmental norms by comparing results (only in the area of personal-social development) with the data from a longitudinal study. The sample for the cross-sectional study was a group of 356 urban children from a broad socioeconomic range, while the 42 subjects of the longitudinal study were mostly from a low income range. The data were collected by use of Gesell's interview schedules modified to suit Indian conditions, and, to determine personal-social development, aspects of behavior such as eating, dressing, and personal hygiene were considered. Of a total of 156 items, the results of the two studies were identical for 35 items and very similar for 26 items. Sixty-one items were not characteristic of any age group. (MH)

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A Comparison of the Norms of the Personal Social Development of the Pre-School Children of Delhi Centre as Obtained by the Cross-sectional Study and the Longitudinal Study.

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Introduction

The present study is a part of the total developmental norms project of pre-school children. The cross-sectional study involved studying children from 2 1/2 to 5 years from the urban, rural and industrial areas of Delhi, Calcutta, Bombay, Madras, Hyderabad, Allahabad and Ahmedabad. The children were divided into six age groups at an interval of six months. Each age group consisted of 60 children, 30 girls and 30 boys. Thus a total of 360 children were studied in each of the three phases. The urban children were selected from the nursery school going population. 25% each were selected from high fee schools and low fee schools and 50% from middle fee schools. The rural sample consisted of a homogeneous group of children drawn from villages mainly agriculturealin nature. The industrial sample was selected from places where at least 60% of the working population was involved in working in industries. At least one of the parents of the children selected was working in an industry.

The aspects of development studied were: Motor, Adaptive, Language, and Personal-social. All the three aspects, Motor, Adaptive and Language, were studied through tests and Personal social Development was studied by interviewing the mothers and teachers. It was also supported by observations on the part of the examiners.

Longitudinal Study

A longitudinal study of middle class urban children was also done for purposes of validation. The study was started at the point when children were 2 years 6 months and 1 day old. These children were re-tested at every 6 months until they were 5 years of age.

Aim of the Present Study

The present study restricts itself to the comparison of the Personal-Social Development of Delhi children as obtained by cross sectional and Longitudinal studies. The aim of the present paper is to validate the results of the cross sectional study by comparing it against the results of the longitudinal study.

Sample under study*

The sample of the cross sectional study consisted of 356 children belonging to urban area. The children were drawn from low, middle and high fee nursery

schools of Delhi, 46% of whom were drawn from the middle fee schools and 26.6 percent each were drawn from the high and low fee schools. The selection of schools and children were done on random basis. The total number of schools from which the sample was drawn was 36.

The sample studied longitudinally consisted of 42 children, 21 boys and 21 girls. The study was first started when the children were 2 1/2 years of age. They were retested at an interval of 6 months until they were 5 years of age. The children were selected after consulting the birth register maintained by the New Dalhi Municipal Committee. After getting the children with the required birth dates, their family backgrounds were checked. Only those children whose parental income was within the range of Rs.170 to Rs. 429 were considered. After getting the possible list of the children, the families were contacted and only such children whose families were cooperative were chosen for testing.

The income range of the parents ranged from Rs.170 to Rs.429. The average income was Rs.317.12. The following table gives the income distribution of the Longitudinal Study sample:

Mid point	Frequency
179.5	4
199.5	2
219.5	0
239.5	3
259.5	4
279.5	4
299.5	3
319.5	0
339.5	2
359.5	7
379.5	2
399.5	7
419.5	4

*For more details of the cross sectional sample, please refer to the Report of Personal Social Development of Children of Delhi by Dr. Mrs. R. Muralidharan, September, 1968.

The occupational distribution of the fathers of the sample is as follows: Office Assistants 2, Technical Assistants 4, Supervisory Jobs 5, Driver 3, Small Business 5, Research Assistants 2, and Stenographers 2.

Procedure

Procedure followed in the cross sectional and the longitudinal study was the same. The interview schedules were based on Gesell's Study but were modified to suit Indian conditions. The schedule comprised of the following aspects of behaviour:

Eating, Sleeping, elimination, dressing, personal-hygiene, communication and developmental detachment.

The information on personal social development of children was filled in after interviewing the mothers either in their homes or at the testing centres according to their convenience. The mode of analysis followed is simple frequency analysis. Any item of behaviour is taken as the characteristic behaviour of an age group if it is shown by 50 percent or more of the children in that particular age group.

Results

The results are given in Appendix. Table I gives the names for such items of behaviour in which the norms are identical in the cross-sectional and longitudinal studies. Table II gives the norms for such items of behaviour where the norms as obtained in the two studies differ by 6 months. Table III gives the norms for those behaviour items in which the difference in norms as obtained by the two studies is more than six months.
Table IV enlists those items of behaviour which do not appear as the characteristics of any age group i.e. those items of behaviour which are not shown by 50% or more of the children in any age group in either of the two studies.

Discussion

With reference to the items of behaviour given in Tables I and IV, the results obtained by the cross-sectional and longitudinal studies are identical. The number of items of behaviour given in Tables I and IV, 35 and 61 respectively, account for 96 items out of a total of 156 items. Thus in sixty percent of the items of behaviour, there is absolute agreement between the results as obtained by the two studies.

Table II enlists those items of behaviour in which the norms as obtained by the two studies differ by 6 months. A difference of six months in the matter of development of a particular behaviour is perhaps negligible and may be due to chance only. It is also likely that the longitudinal sample on account of repeated measurements may tend to be a little more accelerated in development than the cross-sectional sample. In 17 out of the 26 items, given in Table II, the longitudinal sample is found to be the slightly accelerated than the cross-sectional sample. However, as the difference is negligible, it is felt justified to pool these items to the list of items given in Table I and IV. If done so, it includes 112 items out of a total of 156 items. Thus in 70% of items there is a good agreement between the norms as obtained by the cross-sectional and longitudinal studies.

The disagreement in norms between the two studies are therefore with reference to only 34 items of behaviour which are given in Table III. In all the rest of the items, the norms given are either the same or they differ by 6 months or they agree that the items of behaviour are not characteristics of any age group i.e. the behaviour is either outgrown by the group or is yet to develop or neither the mother nor the examiner did get an opportunity to observe the behaviour.

Out of 34 items of behaviour where the difference in norms is more than 6 months 8 items are with reference to general response to meal. The longitudinal sample eats rapidly from 2 1/2 years and is social and talkative during meals only at 5 years. The cross sectional sample on the other hand does not eat rapidly at any age and they are social and talkative during meals from 2 1/2 years. The cross sectional sample eats whatever is given at 5 years but is fussy about menu at 3 1/2 and 4 years. The longitudinal sample on the other hand eats whatever is given up to 4 1/2 years but is fussy about menu at 5 years. It is likely that the longitudinal sample is drawn purely from lower middle class, food is perhaps more precious to them than what it is to the cross sectional sample which is drawn from all the three types of strata, low, middle and high. Only one fourth of the cross sectional sample comes from the low socio-economic strata. The eating situation seems to be not a social situation for the longitudinal sample. On the other hand they concentrate on eating rapidly whatever they are given. Their eagerness for food is also reflected in their offering to serve.

They offer to serve self or others right from 2 1/2 years whereas in the cross-sectional study, it is seen only at 3 and 3 1/2 years. The cross-sectional sample serves self willingly when asked at 5 years but in the longitudinal sample it is seen only in the case of the girls at 5 years.

Serving others willingly when asked does not appear in the case of the longitudinal sample but it appears in the cross sectional sample from 4 1/2 years. Perhaps since the longitudinal sample offers to serve from 2 1/2 years, it was not very necessary for them to be asked to serve.

In the area of sleeping, the items of behaviour, norms of which differ by more than 6 months by cross-sectional and longitudinal studies are: taking nap daily, taking nap in summer only and awakening at night crying when wanting to go to the toliet. The cross-sectional sample takes nap daily only at 2 1/2 years but the longitudinal sample continues to do it up to 2 1/2 years. This may be so because the majority of the longitudinal sample did not go to school in the earlier years, whereas the cross-sectional sample was school-going. The mothers of the longitudinal non-school going sample might have insisted on their children taking a nap daily partly because of the health reasons and partly for their own rest. However, both cross sectional and longitudinal samples continue to take nap in summer right up to 5 years. Awakening at night crying when wanting to go to toilet does not appear at all in the cross-sectional study sample, but it appears at 3 years in the longitudinal sample. It is not clear as to why it does so.

PS 003272

With regard to elimination there is only one item where the difference is more than 6 months in the two types of studies, namely, "being self concious about exposing himself." The cross sectional sample shows this from 4 1/2 years but the longitudinal sample shows it at 2 1/2 years and again at 4 1/2 years. It is likely that the mothers reported it at 2 1/2 years perhaps because they felt that it was socially desirable for their children to feel self-concious about exposing. Later when they got to know the examiner better they might have given her the true picture and that might be the reason why it did not

emerge in the next age groups of 3, 3 1/2 and 4 years. The longitudinal sample, it should be borne in mind, was specially selected from families which agreed to co-operate in the study for a period of 2 1/2 years. Thus the whole approach was more personal than what it was in the cross-sectional study. The sample of the cross-sectional study was selected from school randomly and the parents were contacted through the teachers. Thus the approach was much less personal and therefore there was less likelihood of their giving a socially desirable answer as there was in the case of the mothers of the longitudinal study.

With regard to dressing the cross sectional sample is able to undress with no assistance from 5 years but the longitudinal sample does it from 3 1/2 years. This acceleration of the longitudinal sample is also shown with reference to tying the shoe laces. The cross-sectional sample does not do it up to 5 years but the longitudinal sample is able to tie the shoe laces at 5 years. However, this acceleration is not shown in putting on the shoes. The longitudinal sample is found to be unable to put on shoes up to 3 1/2 years whereas it does not appear in the cross sectional sample. The cross sectional sample is able to put on the shoes correctly from 3 years whereas the longitudinal sample is able to do it only at 5 years. However, they are able to put on the chappals correctly from 4 years. As the longitudinal sample is from the lower middle socio-economic strata it is possible that they are not used to wearing shoes in the earlier years. But they are able to put on chappals correctly from 4 years. For cross-sectional sample the norms for putting on chappals correctly is not available as it was not observed.

With reference to personal hygiene there is only one item of behaviour where there is a difference of more than six months in the norms. It is with reference to bathing on his own. The cross-sectional sample is not able to do it up to 5 years but the longitudinal sample does it at 5 years. Perhaps the difference here may be only by 6 months as it is likely that the cross-sectional sample may also be able to do it by 5 1/2 years.

In the area of communication, lisping and gesticulating are not found in the cross-sectional sample but are observed in the longitudinal sample, lisping up to 3 1/2 years and gesticulating from 3 1/2 years. It is likely that it is because of a mis-interpretation on the part of the examiner. Gesticulating, for instance, might have been interpreted as using gestures while speaking rather than using gestures in the place of speaking.

With regard to play activities, the cross-sectional sample is found to be able to give sustained attention to what they have started until they finished the activity, at 5 years; whereas in the longitudinal sample, it does not emerge in the first 5 years. The other differences are with reference to play interests. Make-believe play, clay modelling, block building and cutting and pasting do not emerge as characteristic interests of the cross-sectional sample but the longitudinal sample appears to take interest in these activities in the pre-school stage. In san play the cross-sectional group takes interest only at 2 1/2 years but the longitudinal group shows interest in it up to 4 years. On the whole it may be said that the play interests of the longitudinal group are more varied than that of the cross-sectional group. However, it should be noted that inspite of the varied

interest, they are not able to pay sustained attention to their play activities.

Sharing toys is seen in the cross sectional sample from 3 years but it is seen in the longitudinal sample only from 4 1/2 years. Bossiness towards his play-mates is seen in the longitudinal sample from 3 years but it does not appear at all in the cross-sectional sample. Competitiveness emerges in the cross-sectional sample only at 5 years but in the longitudinal sample it is seen even from 2 1/2 years. Snatching or grabbing does not appear in the cross sectional study but it is seen at 2 1/2 years in the longitudinal sample. On the whole the longitudinal sample is bossv, shows competitiveness earlier starts to share later and continues to snatch or grab for a longer time. It is again perhaps because they come from purely lower middle class and toys are more precious to them than what they are to the cross-sectional sample.

With regard to developmental detachment in out-for-a walk behaviour, the three items in which the two samples differ by more than 6 months are demanding lifting, wanting to hold adult's hand and lingering back over activities along the way. The longitudinal sample demands to be lifted at 2 1/2 years whereas it does not appear in the cross-sectional sample. On the other hand the cross-sectional sample wants to hold adult's hand while going out for a walk at 3 years whereas it does not appear in the longitudinal sample. The cross-sectional sample is also found to linger back over activities along the way at 3, 3 1/2 and 5 years whereas the longitudinal sample does it only at 5 years. These differences might have arisen perhaps because of schooling. As the cross-sectional sample is a school-going one right from 2 1/2 years, it is likely that they may show developmental detachment a little earlier then the longitudinal sample which started schooling much later.

Conclusion:

The Tables I, II, III and IV show that out of a total of 156 items, the cross sectional study and the longitudinal study give identical norms for 35 items and on 61 items they agree that the items of behaviour are not characteristics of any age group. In 26 items the norms differ only by 6 months. It is only in 34 items that the norms are found to differ by more than 6 months. Even in these 34 items the main differences have appeared in general response to meals and in play interests and play attitudes. This may be because of the fact that the longitudinal sample is drawn purely from a lower middle socio-economic strata and is, therefore, comparatively deprived in terms of food, toys and opportunities for play. Early schooling in the cross-sectional sample may also have contributed to some of the differences in norms between the two samples.

Appendix

Table I - The following table gives the norms for such items of behaviour in which the norms are identical in the cross-sectional and longitudinal studies.

Items of Behaviour	Cross-sectional Study	Longitudinal Study
Eating		
1. While using spoon, can bring spoon to mouth without turning it upside down.	From 2 1/2 years	From 2 1/2 years.
2. While using fingers in bringing food to mouth spills a little.	Up to 3 1/2 years	Up to 3 1/2 years.
3. While using fingers in bringing food to mouth does not spill.	From 4 years	From 4 years.
4. Is able to feed himself	From 2 1/2 years	From 2 1/2 years.
Sleeping		
5. During nap, sleeps easily	From 2 1/2 years	From 2 1/2 years.
6. Goes to bed on his own	From 2 1/2 years	From 2 1/2 years.
7. Has restful sleep	From 2 1/2 years	From 2 1/2 years.
Elimination		
8. Tells need of toliet	Up to 4 1/2 years	Up to 4 1/2 years.
9. Goes to the toliet by himself.	From 2 1/2 years	From 2 1/2 years.
10. Verbally differentiates between bowel and bladder function.	From 2 1/2 years	From 2 1/2 years.
Dressing		
11. Needs assistance in dressing.	Up to 5 years	Up to 5 years.
12. In dressing, does not know back from front.	At 2 1/2 years	At 2 1/2 years.
13. Is able to buckle the shoes	From 4 1/2 years	From 4 1/2 years.
14. Is fussy about dress	From 2 1/2 years	From 2 1/2 years.

contd...

Item of Behaviour	Cross-sectional Study	Longitudinal Study
Personal Hygiene		
15. Washes hands	From 2 1/2 years	From 2 1/2 years.
16. Washing feet	From 2 1/2 years	From 2 1/2 years.
17. Washes face	From 2 1/2 years	From 2 1/2 years.
18. Washes and dries hands	From 2 1/2 years	From 2 1/2 years.
19. Cleans teeth himself	From 3 1/2 years	From 2 1/2 years.
20. Likes to take a bath	Up to 5 years	Up to 5 years.
Communication		
21. Speaks in sentences	From 2 1/2 years	From 2 1/2 years.
22. Verbalises immediate experiences	From 2 1/2 years	From 2 1/2 years.
23. Can tell a long story accurately	At 5 years	At 5 years.
24. Can carry on long involved conversation	From 2 1/2 years	From 2 1/2 years.
25. Asks questions	From 2 1/2 years	From 2 1/2 years.
26. Refers to himself by pronoun	From 2 1/2 years	From 2 1/2 years.
27. Elicits attention of adults verbally	From 2 1/2 years	From 2 1/2 years.
28. Is coherent	From 2 1/2 years	From 2 1/2 years.
29. Speaks without pauses	From 2 1/2 years	From 2 1/2 years.
Play activities		
30. Indulges in active motor play	From 2 1/2 years	From 2 1/2 years.
31. Takes interest in playing with other children.	From 2 1/2 years	From 2 1/2 years.
32. Chooses companions from both sexes.	Up to 5 years	Up to 5 years.
33. While playing with toys takes the toys out carefully	From 2 1/2 years	From 2 1/2 years.
34. Puts the toys back after playing	From 2 1/2 years	From 2 1/2 years.
35. Is careful in using toys	From 2 1/2 years	From 2 1/2 years.

Table II - The following table gives the norms for such items of behaviour where the norms as obtained in the two studies differ by 6 months.

Items of Behaviour		Cross-sectional Study	Longitudinal Study
Eating			
1.	Holds cup with digital grasp while lifting	From 4 years	From 4 1/2 years.
2.	While drinking	From 4 years	From 4 1/2 years.
3.	While replacing	From 4 years	From 4 1/2 years.
4.	Holds glass with both hands while lifting	Up to 3 1/2 years	Up to 4 years.
5.	While drinking	Up to 3 1/2 years	Up to 4 years.
6.	While replacing	Up to 3 1/2 years	Up to 4 years.
7.	While lifting	At 5 years	From 4 1/2 years.
8.	While drinking	At 5 years	From 4 1/2 years.
9.	Holds glass with one hand while replacing	From 4 years	From 4 1/2 years.
10.	While using fingers in bringing food to mouth, smears a little	Up to 3 1/2 years	Up to 3 years.
11.	While using fingers in bringing food to mouth does not smear	From 4 years	From 3 1/2 years.
Sleeping			
12.	Needs some one beside him while going to bed at night	Up to 3 years	Up to 2 1/2 years.
13.	Gets up and goes to the toliet himself	At 5 years	From 4 1/2 years.
Elimination			
14.	Takes complete charge of himself including washing	From 3 years	From 3 1/2 years.
Dressing			
15.	Cooperates in dressing by extending armor leg	Up to 4 1/2 years	From 3 to 4 years.
16.	Is able to button correctly	From 4 1/2 years	From 4 years.
17.	Needs assistance in undressing	Up to 3 1/2 years	Up to 3 years.

Items of Behaviour	Cross-sectional Study	Longitudinal Study
Personal Hygiene		
Washes and dries:		
18. Feet	From 2 1/2 years	From 3 years.
19. Face	From 2 1/2 years	From 3 years.
20. Cleans teeth under supervision	Up to 3 years	Up to 2 1/2 years.
21. Has to be bathed by others	Up to 5 years	Up to 4 1/2 years.
Play activities		
22. Shifts attention rapidly	Up to 4 1/2 years	Up to 5 years.
23. Takes interest in role playing	From 3 years	From 3 1/2 years.
24. Co-operative	From 3 years	From 2 1/2 years.
Developmental Detachment Out-for-a-walk Behaviour		
25. Refuses to hold adults' hands except at crossings	At 4 1/2 & 5 years	At 4 years.
26. Can go out on short errands.	From 3 years	From 2 1/2 years.

contd....

Table III - The following table gives the norms for those behaviour items in which the difference in norms as obtained by the two studies is more than six months.

Items of Behaviour	Cross-sectional Study	Longitudinal Study
General response to meals:		
1. Eats rapidly	Does not appear	From 2 1/2 years.
2. Is social and talkative during meals	From 2 1/2 years	At 5 years.
3. Is fussy about menu	At 3 1/2 and 4 1/2 years	At 5 years.
4. Eats whatever is given to him	At 5 years	From 2 1/2 to 4 1/2 years.
Serves self:		
5. Willingly when asked	At 5 years	At 5 years (only for girls)
6. Offers to serve	At 3 and 3 1/2 years	From 2 1/2 years.
Serves others:		
7. Willingly when asked	From 4 1/2 years	Does not appear.
8. Offers to serve	At 3 & 3 1/2 years	From 2 1/2 years.
Sleeping		
9. Takes nap daily	At 2 1/2 years	Up to 3 1/2 years.
10. Takes nap in summer only	From 3 years	From 4 years.
11. Awakes at night crying when wanting to go to toliet	Does not appear	At 3 years.
Elimination		
12. Is self conscious about exposing himself	From 4 1/2 years	At 2 1/2 years and 4 1/2 years.
Dressing (Self dressing:)		
13. Is unable to dress himself	Does not appear	At 2 1/2 years.
14. Is able to undress with no assistance	From 5 years	From 3 1/2 years.
15. Is unable to put on shoes	Does not appear	Up to 3 1/2 years.
16. Puts on the shoes correctly	From 3 years	At 5 years.
17. Is able to tie the shoe laces	Does not appear	At 5 years.

Items of Behaviour	Cross-sectional Study	Longitudinal Study
Personal Hygiene		
18. Bathes himself	Does not appear	At 5 years.
Communication		
19. Lisps	Does not appear	Up to 3 1/2 years.
20. Gesticulates	Does not appear	From 2 1/2 years.
Play activities		
21. Gives sustained attention to what he has started until he finishes the activity	At 5 years	Does not appear.
Takes interest in:		
22. Make-believe play	Does not appear	From 4 years.
23. Dolls play	Up to 3 years (up to 5 years for the girls)	Up to 5 years.
24. Sand Play	At 2 1/2 years	Up to 4 years.
25. Clay modeling	Does not appear	At 4 1/2 and 5 years.
26. Block building	Does not appear	From 3 1/2 years.
27. Cutting and pasting	Does not appear	From 3 years.
28. Snatches or grates	Does not appear	At 2 1/2 years.
29. Shares	From 3 years	From 4 1/2 years.
30. Bossy attitude towards playmate	Does not appear	From 3 years.
31. Competitive attitude towards playmate	At 5 years	From 2 1/2 years.
Developmental Detachment		
Out-for-a-walk behaviour		
32. Demands lifting	Does not appear	At 2 1/2 years.
33. Wants to hold adult's hand	At 3 years	Does not appear.
34. Lingers back over activities along the way	At 3, 3 1/2 and 5 years	At 5 years.

contd....

Table IV - The following list enlists those items of behaviour which do not appear as characteristics of any age group i.e. those items of behaviour which are not shown by 50% or more of the children in any age group in either of the two studies.

Eating

Holding cup with both hands while:

1. lifting
2. drinking
3. replacing

Holding cup with palm while

4. lifting
5. drinking
6. replacing

Spilling content while

7. lifting
8. drinking
9. replacing

Eating

Spilling content while drinking from glass when

10. lifting
11. drinking
12. replacing
13. Spilling considerably while eating with fingers.
14. Smearing all over the face while eating with fingers.
15. Taking milk from bottle.
16. Needing to be fed.
17. Needing help in feeding.
18. Refusing food
19. Dawdling and playing with food.
20. Frequently getting up between meals.

Sleeping

21. Taking nap in winter only.
22. Taking nap rarely.
23. Never taking a nap.
24. During nap, only resting in bed.
25. During nap, even resisting resting.
26. Needing to be put to bed.
27. Trying to put off going to bed.

For going to bed, needs:

28. lullaby
29. stories
30. a toy beside him
31. Wetting the bed.
32. Needing to be picked up at specific times for tolieting.
33. Tossing in sleep.
34. Gritting the teeth.
35. Muttering in sleep.
36. Awakening from sleep crying.

contd.....

Elimination

37. Indicating wet pants, after elimination.
38. Needing to be taken to toliet at special times.
39. Using same words for bowel and bladder functions.
40. Showing interest in bowel functions.

Dressing

41. Being able to dress himself without any assistance.
42. Dressing with care.
43. Being unable to undress himself.
44. Undressing with care.

Communication

45. Speaking in words.
46. Speaking in phrases.
47. Mixing real with unreal.
48. Referring to himself by name.
49. Calling people by names.
50. Calling people names.
51. Using words which are used by children only.

Play Activities

Taking interest in:

52. Working on special projects.
53. Mechano sets.
54. Block building.
55. Aimlessly walking or running.
56. Being solitary onlooker.
57. Playing with companions of opposite sex only.
58. Playing with companions of same sex only.
59. Being destructive while playing with toys.
60. Being submissive towards his play mates.

Developmental Detachment
Out-for-a-walk Behaviour

61. Running ahead of adults.